

REMARKS

Claims 1-15 are pending in the application. Claims 1-15 stand rejected under 35 U.S.C. §102(e) as being anticipated by Cole (U.S. Patent No. 6,919,730). With this response, claims 13 and 15 are amended. No new matter is added by amendment. Reconsideration of the claims, in light of the remarks that follow, is respectfully requested.

Cole discloses carbon nanotube-based sensors (title). As illustrated in Fig. 2D, the carbon nanotubes 270 grow from projections 260 on platform 240, which is supported by substrate 210. The nanotubes can be clearly seen to grow substantially vertically from the projections, and perpendicularly to the platform. Cole discloses using the nanotubes in heat sensors and in gas sensors. For the heat sensors, the nanotubes form a “tangle which traps heat produced by IR radiation” (col. 3, lines 31-32). A heat sensor near the nanotubes measures the resulting change in temperature. For the gas sensors, multiple nanotubes are formed between conductors, and IV characteristics of the nanotubes are measured in the presence of a gas (abstract). Cole discloses applying an electric field to control the direction of growth of the carbon nanotubes, the alignment of which can be seen in Figs. 3 and 4, to provide a “point to point connection” between the conductors (col. 4, lines 16-19).

In contrast, claims 1, 6, 11, and 12 recite a conductive trace including “a plurality of unaligned nanotubes” for providing “a plurality of conductive pathways” along a trace. As described in greater detail in the Response dated January 17, 2006, in some embodiments, a conductive trace may be formed by patterning a non-woven fabric of nanotubes; the nanotubes in the trace provide many alternate paths through which electrons may travel, e.g., conductive pathways. An example of such a trace is illustrated in Fig. 17.

Cole does not disclose a plurality of unaligned nanotubes for providing a plurality of conductive pathways along a trace. The Examiner appears to argue that the platform 240 of Fig. 2D forms a conductive trace, and that the nanotubes 270 provide a plurality of conductive pathways along the trace. Applicants disagree that this structure even resembles the claimed invention, an embodiment of which is illustrated in Fig. 17. Moreover, the nanotubes 270 do not provide a plurality of conductive pathways along platform 240, as required by claims 1, 6, 11, and 12. “Along” generally means lengthwise with, longitudinal with, and/or parallel to. The

nanotubes disclosed by Cole in Fig. 2D extend perpendicularly away from platform 240, and thus could not reasonably be construed to form conductive pathways along a trace, as recited in claims 1, 6, 11, and 12. The same holds true for the gas sensor nanotubes disclosed by Cole, e.g., in Figs. 3 and 4. The nanotubes contact the two electrodes, and at those contact points the nanotubes extend perpendicularly away from the electrodes. Therefore the nanotubes cannot reasonably be construed to form conductive pathways along the electrodes. Moreover, Cole discloses deliberately aligning the gas sensor nanotubes, which is contrary to the requirement of the claims that the nanotubes be unaligned. In summary, Cole does not disclose or suggest anything resembling a plurality of unaligned nanotubes for providing a plurality of conductive pathways along a trace, and therefore does not anticipate claims 1, 6, 11, and 12, or claims dependent thereon.

Cole also does not disclose or suggest “a non-woven fabric of unaligned nanotubes substantially parallel to and covering a major surface of the wafer substrate,” as recited in claims 13 and 15 as amended. Cole discloses nanotubes that are substantially perpendicular to the major surface of a substrate, platform, or electrode. Thus, Cole does not anticipate claims 13 and 15 as amended.

Cole also does not disclose or suggest “a non-woven fabric of unaligned nanotubes... wherein the fabric is substantially a monolayer of nanotubes,” as recited in claim 14. Cole discloses “tangles” of nanotubes for use in heat sensors, and aligned nanotubes for use in gas sensors, and in all cases, the nanotubes are perpendicular to the substrate, platform, or electrode. None of the nanotube structures disclosed by Cole resemble a non-woven fabric of unaligned nanotubes that is substantially a monolayer. Therefore, Cole does not anticipate claim 14.


In view of the above amendment, Applicants believe the pending application is in condition for allowance. No fees are believed to be due at this time. However, please charge any fees, or credit any over payment, to Deposit Account No. 08-0219.

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